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Natural Family Planning

Adolescents and Young Adults Have Poor Knowledge of Family Planning Methods and in Particular Natural Family Planning

Based on ongoing evidence that there is a high rate of sexual activity and unplanned pregnancies among young adults and adolescents, researchers set out to assess the knowledge of family planning methods among this population (Sokkay, Mansouri, and Yoost, et al. 2013). Participants were 10 to 24 years of age and were recruited as they presented to four pediatric clinics located in Houston, Louisville, St. Louis, and Toronto, (for those under the age of 18 a signed parental consent form was required). The participants were provided a 23 item true/false survey to assess their knowledge of the efficacy, side effects, and misconceptions regarding the most common family planning methods including abstinence and Natural Family Planning (i.e., referred to as “Rhythm” in the article).

The four clinic sites yielded 354 completed surveys that represented a mean age of 16.2 (SD = 2.9) for the participants, of which 39.6% reported being sexually active, 65.8% indicated using some form of contraception in the past, and only 2% having ever been pregnant. The major finding was that 55.8% (SD = 17.7%) was the mean correct score of the participants with progressively higher scores with increased age, sexual activity, and higher number of sexual partners. Participants were least likely to have knowledge of contraceptive implants (18%), NFP/Rhythm (28%) and the intrauterine device or IUD (32%). Most (97%) were familiar with the hormonal pill and with condoms (92%). Significantly higher scores were noted among those who sought information on contraception through the internet and who were familiar with abstinence. A conclusion was that adolescents and young adults need more education on methods of contraception and in particular what are now called long acting reversible contraceptives (LARC), i.e., the IUD and hormonal implants.

Comment

Of interest is that the authors mentioned that only 29.9% of the participants correctly responded that “the Rhythm Method” was the least effective method of birth control. This shows a bias or lack of validity of the survey, as there are no randomized comparison studies with use of the Rhythm Method (when taught as a method rather than a self-devised method) and other forms of birth control. Furthermore, it was unclear if the term they used was Natural Family Planning in the survey or “Rhythm” – as they use both terms in the article. The fact that there was only a 2% pregnancy rate among the participants indicates that the participants were not reflective of the United States or North American population of adolescents and young adults. The authors also appear to ignore the known risks of implantable contraceptives and IUDs in young adults and adolescents. They recommend more education on these methods, but did they include education on the side effects (including sterility and psychological effects).

Sokkay, N., R. Mansouri, and J. Yoost, et al. 2013. **A multicenter survey of contraceptive knowledge among adolescents in North America.** *Journal of Pediatric and Adolescent Gynecology* 26: 274-276.

Higher motivation to avoid pregnancy increases the efficacy of Natural Family Planning

Reviewed by Thomas Bouchard, M.D., Department of Family Medicine, University of Calgary

Family planning methods that rely on user behavior, like Natural Family Planning (NFP), are dependent on a couples' motivation for avoiding pregnancy. Unlike the binary terminology "intended vs unintended pregnancy" used in most contraceptive literature, the subtlety of couples' motivation is more accurately understood on a spectrum of more or less motivation to avoid pregnancy, rather than the "achieving or avoiding" dichotomy.

Fehring and colleagues (2013) evaluate this spectrum of motivation in their recent article and quantify what we would expect empirically among Natural Family Planning (NFP) users. The motivation evaluation was a secondary analysis in this 12 month randomized prospective comparison of two online NFP methods (using an ovulation-based algorithm with either a urine fertility monitor or cervical mucus monitoring). To stratify motivation, a standardized measurement tool was used in which couples were asked to rate on a scale of 0 to 10: 1) how hard they are currently trying to avoid pregnancy, and 2) how much they want to avoid pregnancy. The first question assesses motivation in terms of the couples' actual behavior, and the second assesses motivation in terms of their stated goal or intention. "High" motivation was considered a score of 9 or 10 on the two motivation questions; others (scoring motivation at 8 or below) were considered "Low" motivation users for the purpose of statistically comparing the two groups (i.e. "Low" vs "High" motivation). Importantly, Fehring and colleagues also look at change in motivation over time.

Of the 358 participants, 198 were in the monitor group and 160 were in the mucus group. Of these, 298 fell into the "High motivation" category, and 60 into the "Low motivation" category. There was no difference in motivation between the fertility monitor and the mucus groups. The 12-month pregnancy rate for the "high motivation" group was 8 per 100 women vs 75 per 100 women in the "low motivation" group. This amounted to a 20 times greater likelihood of an unintended pregnancy in the "low motivation" group. There was a significant decrease in motivation over 12 months of use, and as motivation decreases, the likelihood of unintended pregnancy increases over the 12 month period. Of interest, the monitor group had a higher rate of decrease in motivation over time, and the authors attribute this to participants wanting to use the monitor (which was free with participation in the study) to achieve pregnancy over time.

Comment

There is tremendous clinical importance in evaluating a couple's motivation when discussing use of Natural Family Planning. Fehring et al.'s study highlights that when discussing the use of NFP, couples should be aware that their motivation in both behavior ("how hard they are trying to avoid pregnancy") and in intention ("how much they want to avoid pregnancy") will impact the efficacy of the method they use.

It would have been helpful if the authors described how they chose the "9-10" score as a cutoff for those who have "High" motivation (the author explained in a personal communication that this was done statistically, but it should have been described in the paper). On this same point, it is interesting that the strength of the study lay in asking the question of motivation along a spectrum to emphasize the subtlety of this issue, but the authors then turn motivation into a binary problem again with their division into "High" and "Low" motivation. Certainly this was done to help with the statistical analysis, but I presume with a larger sample size, it would have been possible to do a multiple comparison test along the motivation spectrum rather than having to classify into the "High" and "Low" categories.

This study demonstrates that in the setting of teaching couples to use NFP, motivation must be emphasized when discussing the divergence in efficacy when motivation to avoid pregnancy is not high. Fehring et al. set a new standard for future studies on NFP efficacy by showing that motivation is a key factor that must be accounted for. As the authors suggest in the discussion, it might be possible to improve the efficacy of a method if there are dynamic ways of reminding couples when their reduced motivation leads them to ignore the rules of the NFP method, for example, with electronic reminders in a fertility App that warn couples about the chance of pregnancy on different days in the cycle.

Fehring R., M. Schnedier, M.L. Barron, J. Pruszynski. 2013. **Influence of motivation on the efficacy of natural family planning.** *American Journal of Maternal Child Nursing* 38: 352-358.

Poor Knowledge of Fertility Awareness Based Methods (FABM) found among Young Minority (Latina and African American) Women in the United States

According to data in the National Survey of Family Growth, a good percentage of minority women (i.e., Hispanic and African American women) have used fertility awareness based methods (FABM) of family planning (from 13-17%) compared with only approximately 4% among all reproductive age women in the United States (US) population. Part of the reason is that FABMs are low in cost or free, they do not require a clinic visit or health care provider, are drug free and have no side effects. At the same time, FABMs require a fairly high level of information about the menstrual cycle and fertility, high motivation for correct use, and

knowledge of protocols for following a FABM for avoiding pregnancy. Since FABMs have many advantages for minority women in the US, researchers from Child Trends in Washington DC sought to determine the knowledge and use of FABM among Latina and African American minority women by conducting in depth interviews (Guzman, Caal, Peterson, Ramos, and Hickman 2013).

Researchers were able to obtain 58 minority women by purposeful sampling of minority women (who have or had used FABMs in the past) through word of mouth, community Web sites, flyers, and family planning clinic sites. Of the 58 participants, 28 were Latina, and 30 African American. Their median age was 24 and ranged from the ages of 18-29 years. Thirty-one were in a romantic relationship, 12 were cohabitating, and 7 were married. At the time of interview, 39 participants were currently using a FABM and the remainder used some form of a FABM in the past. From the interview and analysis process, the researchers categorized the participants into three groups, i.e., those who were very informed about FABM ($n = 21$), those who were somewhat informed ($n = 23$), and those who were not at all informed ($n = 14$). They also found that a little over half of the participants ($n = 32$) had accurate knowledge of the fertile window of the menstrual cycle and when to abstain from intercourse. They found that participants received information on FABM from a variety of sources, including friends, family members, partners, resource counselors and print media. In general they found that there were two broad categories of FABM information, i.e., 1) superficial knowledge that there is a fertile and infertile phase in the menstrual cycles, and 2) in depth knowledge of the menstrual cycle and how to track the fertile and infertile phase. The researchers concluded that there was a large gap of knowledge in how to effectively use FABM among a minority population.

Comment

The authors suggested that health professionals need to provide information on FABMs so that users can use these methods with confidence and accuracy. They also recommended that health professionals actively inquire about FABM use among their patients in order to identify those who are in most need of this information. That many in the medical community lack information and skills to assess or provide women with this information shows a failure of medical education and the bias towards providing methods of family planning that suppress or block (not integrate) human fertility.

Guzman, L., S. Caal, K. Peterson, M. Ramos, and S. Hickman. 2013. **The use of fertility awareness methods (FAM) among young adult Latina and black women: what do they know and how well dot they use it? Use of FAM among Latina and black women in the United States.** *Contraception* 80: 232-238.

Fertility

Consistent Cervical Mucus Monitoring (CMM) Associated With Increased Fecundity

Previous retrospective studies have demonstrated that having intercourse on days with more fertile type cervical mucus resulted in a higher probability of pregnancy (Stanford, Smith, and Dunson 2003); however, there are no prospective studies to provide a higher level of evidence that this is the case. A prospective cohort study was conducted to determine if use of self-monitoring of cervical mucus is associated with an increased cycle-specific probability of conception (Evens-Hoeker, Pritchard, Long, Herring, Stanford, and Steiner 2013). This study differed from previous studies in that it involved use of cervical mucus monitoring (CMM) without formal training.

The participants were 331 women who were between 30 and 44 years of age and were trying to achieve pregnancy for 3 months or less with no history of infertility problems. The participants were instructed how to use a daily diary to include information on vaginal bleeding, intercourse, and any methods used to test for the fertile window, e.g., urinary luteinizing hormone (LH) monitoring. Those who also reported that they used CMM were asked to record the level of mucus from 1-4 (with 4 being the more fertile estrogenic mucus) but were provided no other instructions and were not required to perform CMM.

After one cycle of charting, 23% of the participants achieved a pregnancy and by 6 months 53% achieved a positive pregnancy test. One-hundred-seventy-eight (58%) of the participants however, did not use CMM; 73 (22%) used CMM infrequently; 60 (18%) used it inconsistently; and only 20 (6%) monitored CMM consistently. After adjusting for a baseline consistency of use of CMM, age, intercourse frequency, LH testing, and weight, increased CMM was not statistically associated with increased fecundity; however, with the same adjustments, conception was statistically more likely to occur during cycles in which women consistently used CMM (FR = 2.29; 95% confidence interval, 1.22 – 4.32). This study demonstrates that CMM is infrequently used by women wishing to achieve pregnancy but that with consistent CMM there is increased fecundity. This increase occurred with a simple self-directed method of CMM.

Comment

The authors felt that wide spread use of CMM could potentially lower the incidence of infertility and the need for fertility services. This study did not compare other methods of estimating the fertile window of the menstrual cycle and only 20 women consistently used CMM, so the evidence for this assumption or implication is rather weak. There is a need for prospective comparison studies with other self-directed methods of estimating the fertile phase and with using frequent intercourse (which currently is recommended by the American Society of Reproductive Medicine). I would also recommend a comparison with using fertility monitoring aids like the Clearblue Easy Fertility Monitor or the new Clearblue Advanced Digital

monitor – both monitors provide an estimation of the fertile window based on urinary levels of estrogen and the LH surge.

Evens-Hoeker, E., D. A. Pritchard, D. L. Long, A. H. Herring, J. B. Stanford, J. B., and A. Z. Steiner. 2013. **Cervical mucus monitoring prevalence and associated fecundability in women trying to conceive.** *Fertility and Sterility*, Article In Press.

Stanford, J. B., K. R. Smith, and D. B. Dunson. 2003. **Vulvar mucus observations and the probability of pregnancy.** *Obstetrics and Gynecology* 101: 1285-1293.

Intercourse focused on high and peak days of the fertile window leads to higher pregnancy rates than intercourse on low days in the fertile window

Reviewed by Thomas Bouchard, M.D., Department of Family Medicine, University of Calgary

To health care providers experienced in Natural Family Planning (NFP) methods, it may seem self-evident that focusing intercourse in the fertile window increases pregnancy rates. Mu and Fehring (2014) explain, however, that there is a “deficit in fertility knowledge” among women of reproductive age and a lack of evidence-based recommendations among the medical community unfamiliar with NFP who recommend “frequent random intercourse” (American Society for Reproductive Medicine). Several previous studies have demonstrated shorter time to pregnancy with focusing intercourse in the fertile window (the 6 days leading up to and including the estimated day of ovulation). In this study, Mu & Fehring set out to compare intercourse among couples trying to conceive who have intercourse on self-identified high and peak days in the fertile window vs intercourse only on low days in the fertile window. Low, High and Peak days of the fertile window were identified either by cervical mucus observation or with the use of the ClearBlue Fertility Monitor that identifies estrogen and LH in the urine, or using both mucus and the monitor.

In a 12-month prospective observational cohort study, the authors recruited a convenience sample of 124 participants who consented and registered online to use the Marquette Method website and indicated a desire to achieve pregnancy (their power analysis recommended a minimal sample size of 117). Participants were mostly just under 30 years of age, Catholic (92%), and had been trying to conceive on average 4 months prior to beginning the online protocol. Of these, 11% were trying to conceive for >6 months prior to the study and 8% were trying to conceive for >12 months prior to the study. There was no description of the medical comorbidities of the participants, but the authors do mention that 76% reported themselves as having regular cycles.

There were 59 pregnancies in the entire cohort, giving a total pregnancy rate of 65 pregnancies per 100 women over 12 months. There were 57 correct-use pregnancies

(pregnancies from intercourse on high and peak days in the fertile window) and 2 incorrect-use pregnancies (from intercourse on only low days in the fertile window). The survival analysis yielded a correct-use pregnancy rate of 87 per 100 women over 12 months compared to 5 per 100 women in the incorrect-use group, which was significantly different. (NB: The survival table and the total pregnancy numbers in the text do not match because there were pregnancies that occurred outside the 12 month survival period). They note that the pregnancy rate was higher in women under 30 years of age (100 per 100 women at 12 months) than women over 30 years (84 per 100 women at 12 months). Of the women (N=25) trying to conceive prior to the study, there were 8 pregnancies (32%).

The authors conclude that teaching women to recognize the high and peak days of the fertile window increases the rate of pregnancy at 12 months and suggest that more concrete recommendations by health care providers could be given rather than “random frequent intercourse” to optimize the chances of pregnancy.

Comment

This study further emphasizes the importance of educating women about the fertile window to optimize the chance of pregnancy. Most randomized studies on fertility treatments compare expectant waiting (“frequent, random intercourse”) to an intervention, but Mu & Fehring’s results suggest that the standard of care should involve a more concrete recommendation for focused intercourse in the fertile window. Moreover, even though there were a small number of women in a hypofertile/infertile category (only 8% had been trying for > 12 months prior to the study), it would seem like couples trying to conceive should be given at the very least a basic understanding of the fertile window to time intercourse appropriately and optimize their chance rather than waiting the usual 12 months before making specific recommendations. More ideally, however, a couple should have regular follow-up with their health care provider to continue to refine their understanding of the fertile window to help with conception.

This study demonstrates that a large proportion of couples trying to conceive may benefit from this simple non-interventional approach of focused intercourse. A follow-up study should better describe the population in terms of medical comorbidities, and discuss options for treatment for these women in addition to fertility-focused intercourse (e.g. lifestyle interventions for metabolic syndrome/polycystic ovarian syndrome, thyroid treatment, clomid if necessary), but these approaches should be evaluated individually in successive studies rather than all at once, in order to identify the impact of each particular intervention.

It would have been helpful to know the day of conception relative to the estimated day of ovulation, to identify when pregnancies occurred in the cycle. There is a brief mention of age differences in conception, but more detail in the future with a larger sample size would be

helpful. Attrition in this study is not mentioned - it should be acknowledged how many women survived to different months on the survival curve.

Mu, Q. and R. Fehring. 2014. **Efficacy of achieving pregnancy with fertility-focused intercourse.** *MCN: The American Journal of Maternal Child Nursing*, 39: 35-40.

Menstrual Cycle

Day-specific Probabilities of Conception Determined in Fertile Menstrual Cycles

Previous studies on the probabilities of pregnancy from an act of intercourse during the menstrual cycle indicate that there is some probability of pregnancy on every day of the menstrual cycle (Wilcox, Dunson, and Baird 2000). The results of these studies however, (that an act of intercourse on the first and last day of the menstrual cycle could result in a pregnancy), could be a result of measurement error. Researchers from France speculated that there probably was some error in determining probability of pregnancy based on data that was obtained from hormonal changes, serial ultrasound, and natural indicators of fertility (e.g., basal body temperature shifts and cervical mucus monitoring) to estimate the day of ovulation (Stirnemann, Samson, Bernard, and Thalabard 2013). These researchers also speculated that basing probabilities of pregnancy on non-fertile cycles might skew the data. They stipulated that basing probabilities of an ongoing pregnancy from an act of intercourse on the day of conception rather than the day of ovulation would be more accurate. They conducted a study based on the last menstrual period (LMP) and ultrasound biometry for dating conception among women who have delivered a full term pregnancy to determine probabilities of pregnancy throughout the menstrual cycle.

These researchers obtained data from all consecutive pregnancies referred for a first trimester (i.e., 11-14 weeks) ultrasound to determine the age of a singleton unborn baby and day of conception, from a three year period. They also used a formula for correcting bias in biometry measurement. They were able to access the data from 5830 women (median age 30; range 27-34 years) who reported their LMP with certainty and who had a routine ultrasound examination. They found that the probability of pregnancy has a sharp rise on day 7 of the menstrual cycle, peaks at a maximum of 13% on day 15, and decreases to 0 by day 25 following the LMP. They also found that the maximum day of probability was one day earlier for women over 35 years; however, the probability of being in the fertile window (based on a six day fertile window) was 2% on day 4, 58% on day 12, and 5% by day 21. They concluded that considering day-specific probability of conception rather than day specific probability of ovulation is more pragmatic and clinically relevant.

Comment

The researchers also investigated the difference in day specific probabilities between reported regular cycles and irregular cycles and found with irregular cycles (i.e., 14% of the data) conception occurred later in the menstrual cycle. This study illustrates the importance of using accurate measures for providing evidence of fertility and probabilities of pregnancy. This information is of particular importance when women or couples using NFP methods question their probability of pregnancy from an act of intercourse that occurred when they did not consistently follow the rules for avoiding pregnancy.

Wilcox, A. J., D. Dunson, and D. D., Baird. 2000. **The timing of the ‘fertile window’ in the menstrual cycle: day specific estimates from a prospective study.** *British Medical Journal*, 321: 1258-1262.

Stirnemann, J. J., A. Samson, J. P. Bernard, and J. C. Thalabard. 2013. **Day-specific probabilities of conception in fertile cycles resulting in spontaneous pregnancies.** *Human Reproduction*, 28: 1110-1116.

Contraception

Physicians Influence Contraceptive Choices among Adult Women: Persona® most Frequent Choice of Natural Family Planning Methods

Based on the knowledge that there still is a high unintended pregnancy rate among women in developed countries and that the hormonal contraceptive pill remains the most used method of family planning, researchers sought to determine women’s knowledge of and reasons for selecting a method of family planning (Johnson, Pion, and Jennings 2013). A secondary reason for this study was that the hormonal pill and condoms have been around for many years and there are now many newer methods of family planning, including newer methods of natural family planning (NFP). The researchers expressed concern is that there is a lack of knowledge of these newer methods.

The participants for this study were between the ages of 25-44 and were from five countries, i.e., the United Kingdom, Germany, Italy, Spain, and the United States of America (USA) and except for Italy, they were obtained from an online panel of users. The online panels have adequate numbers of participants (e.g., over 1 million in the USA) to provide representative samples from each country. A minimum of 500 were recruited from each country and were provided an online survey to assess knowledge of family planning methods, reasons for their choice, reasons for changing methods and sources of information on methods. The survey included a choice of the most common Natural Family Planning (NFP) methods. The Italian

participants were interviewed and administered the survey in their homes. The mean age of the participants was 35 years and most (70%) were either married or living with a partner.

The most frequent methods of family planning used by the participants were the contraceptive pill followed by the condom, with a range from 35% in Spain to 63% in Germany with use of the pill and from 20% in Germany to 47% in Spain with use of the condom. The only NFP method that received greater than 1% was the Persona® fertility monitor (i.e., a monitor that measures urinary metabolites of estrogen and luteinizing hormone to estimate the fertile phase of the menstrual cycle). This electronic hormonal fertility monitor designed for avoiding pregnancy is not sold in North America. The most frequent reasons for choosing the contraceptive pill were reliability in preventing a pregnancy, ease of use, comfortable, and recommended by doctor. The most frequent reason for changing methods of family planning were desire for pregnancy, partner was sterilized and side effects (e.g., menstrual bloating). The most frequent reasons that would prompt women for changing family planning methods were health concerns, weight gain, and having no interest in a future pregnancy. Physicians (both specialists and primary care) had the greatest influence in choice of contraceptive method, with the pill and condom the most frequently recommended methods. Besides health care professionals, the internet and family members/friends were the most frequent sources of advice on family planning methods. The authors concluded that health care professionals need to provide more information on benefits and risks of all available contraceptive/family planning methods.

Comment

Although there was a fairly large pool of participants from each country, this study was not population based and represented women (for most part) who use online sites and the internet. This bias was reflected in some of the responses, for example, there was zero responses for receiving family planning advice from nurse practitioners or family planning nurses. In the USA, many (if not most) poor women receive contraceptive methods from Title X funded clinics that are staffed primarily by advanced practice nurses. Given that limitation, the study does point out the importance of physicians (and other health care providers) as gate keepers of family planning methods, and the importance of providing women with unbiased, ethical/moral, and evidenced based information. It would be interesting to conduct a similar study to assess knowledge base of the responders with regards to the risks of the various methods of contraception.

Johnson, S., C. Pion, and V. Jennings. 2013. **Current methods and attitudes of women towards contraception in Europe and America.** *Reproductive Health* 10:7.

Under the Microscope

The Influence of Ever Use of Natural Family Planning and Contraceptive Methods on Divorce Rates as Found in the 2006-2010 National Survey of Family Growth

NFP and Marital Dynamics

The question of how the use of Natural Family Planning (NFP) affects marital relationships (and in particular divorce) is a question of importance to NFP couple users, NFP teachers and advocates, and health professionals. One of the often repeated comments by NFP teachers and others is that there is less divorce among couples who use NFP. There is very little evidence and scant research to validate this statement. The purpose of this in-depth report is to determine the influence of NFP and other methods of family planning on divorce rates among Catholic women of reproductive age as found in data from the 2006-2010 National Survey of Family Growth (NSFG).

Review of Studies

Research findings on marital, sexual and spiritual dynamics of NFP seem to indicate that NFP is helpful to marital life. Marshall and Rowe (1970) reported that 74% of husbands and 75% of the wives found the use of the Basal Body Temperature Method (BBT) of NFP to be helpful to marriage. These results are similar to English and Welsh couple users of NFP in which 75% of the wives felt NFP was helpful to marriage (Fragstein, Flynn, and Royston 1988). Fehring and Rodriguez (2013) reported that 80% of the husbands and 85% of the wives felt that using NFP was helpful to their marriage. Research also indicates that most users of NFP are satisfied with their use of NFP, most find periodic abstinence is not a problem and that NFP enhances their sexual drive (Vandevusse, Fehring, and Hansen 2003). In comparing couple users of NFP with a similar cohort of couples using contraceptive methods (i.e., the hormonal birth control pill) Fehring and Lawrence (1994) found that NFP couples reported higher levels of spiritual well-being and intimacy. In contrast, Oddens (1999) found greater satisfaction with sterilization, the birth control pill and condom use among European couples but less sexual satisfaction and fear of side effects compared with NFP users. Despite this work, all of these results need to be qualified in that there are not a lot of good published studies on the effects of NFP on marital dynamics. In addition, there are no studies comparing divorce rates and marital dynamics with couples who are using other methods of family planning in which participants are selected from a large diverse population of users.

New Information on NFP and Divorce Rates

Scientists at the National Center for Health Statistics (NCHS) and the Center for Disease Control and Prevention (CDC) conduct the National Survey of Family Growth (NSFG) approximately every 5-7 years. The NSFG includes factors that help explain trends in contraception use, infertility, sexual activity, abortion, pregnancy outcomes and marital status. The NSFG researchers use a nationally representative, randomly selected sample of women 15-44 years of age in the United States (US). In 2011, the 2006-2010 (Cycle 7) of the NSFG was

released for public research use. There are 5,102 Catholic women in the Cycle 7 version of the NSFG.

The NSFG/CDC web site (http://www.cdc.gov/nchs/nsfg/key_statistics/d.htm#divorce) reports marital disruption probabilities over time. The 2006-2010 data report indicates that within 20 years 48% of first time marriages will be disrupted by divorce or separation, and that by 5 years 86% of couples who are separated will be divorced. The report also indicates that within 5 years 46% of second marriages will end in marital disruption.

Wilson compared the divorce rate of 505 Catholic women (aged 21-44) selected from NFP programs with the 10,471 women in the 1995 NSFG. She found that 3% of the NFP users in the NFP programs reported they were divorced as compared with 15% of the Catholic women in the 1995 (Cycle 5) of the NSFG. Wilson concluded that there is less divorce among NFP couples than couples using contraception. Although there was an obvious difference in divorce rates, the two groups of Catholic women in the Wilson study are not from the same population of women. The NSFG women are population based in that they are randomly selected from United States women of reproductive age, and as such the data from the NSFG can be used to make comments about women in general in the US. The Wilson survey group of NFP Catholic women were self-selected from a small group of users in select NFP provider programs; therefore, the two groups of women are not comparable and the differences in divorce rates could be due to many reasons other than use of NFP. Women and couples who use NFP frequently use NFP due to religious reasons and/or find religion to be very important in their lives. Furthermore, frequent church attendance is a very good measure of how serious individuals take their religious beliefs, and this in turn could have an influence on divorce rates. The purpose of this article is to examine new data from the 2006-2010 (Cycle 7) NSFG and to determine the influence of ever use of select family planning methods (i.e., the hormonal pill, sterilization, and NFP) and frequency of church attendance on the divorce rates of sexually active Catholic women.

Methods

The 2006-2010 NSFG is a population based selection of 12,676 women. The data set contains variables on ever use of abortion, methods of hormonal contraception, and variables of marital status, importance of religion, church attendance, and attitudes on human sexuality. This report only includes the 1,502 women in the NSFG who indicate that they were of the Catholic faith.

The three family planning methods chosen for this study from the NSFG were hormonal agents, sterilization, and NFP. Natural methods were either the modern methods of cervical mucus, temperature monitoring, or Rhythm. The hormonal agents and sterilization were used because they are by far the most frequently used methods of family planning by reproductive age women in the United States. In the NSFG respondents could choose 1 of 5 items for a response as to the frequency of church attendance; 1) more than once a week, 2) once a week, 3) 1-3 times per month, 4) less than once a month, and 5) never. For analysis purposes the responses were collapsed into 2 categories: 1) Frequent Church Attendance = more than once a week and once a week, and 2) Not Frequent Church Attendance, i.e., 1-3 times per month, less than once a month, and never. Ever use of NFP (mucus or temp.), the hormonal pill, and sterilization were also used

in this analysis. The dependent variable for this study was currently divorced or not. Odds Ratios (OR) were calculated to determine influence of ever use of NFP, Rhythm, hormonal pill, or sterilization compared to never use on current divorce status.

Results

There were 1,502 Catholic women in the 2006-2010 NSG or approximately 12% of the total population. Among the Catholic women who ever used NFP (i.e., the cervical mucus method and/or temperature) only 9.5% were currently divorced, this compares with 18.3% who never used NFP.

The two family planning methods with statistically significant odds ratios (OR) were sterilization, with a 2.4 times more likely to be divorced compared to those Catholic women who were never sterilized, and NFP users who were 53% less likely to be divorced compared to those women who never used NFP. Those women who had frequent church attendance had a 34% less likelihood of being divorced compared with women who had less frequent church attendance. The use of the pill and rhythm had no significant influence on divorce rates (See Table 1).

Table 1: Odds of divorce among 1,397 Catholic women who never used NFP compared with 105 Catholic women who ever used NFP

Method	Odds Ratio	95% CI	Significance
Pill (OC)	1.05	0.76 – 1.45	p < .742
Sterilized	2.41	1.82 - 3.20	p < .001
Rhythm	0.76	0.54 – 1.06	p < .109
NFP	0.47	0.24 – 0.91	p < .023
Church Attend	0.66	0.49 – 0.89	p < .007

Discussion

Based on the 2006-2010 (Cycle 7) NSFG it was discovered that the percentage of Catholic women of reproductive age who indicated ever using NFP, their marital status of “divorce” was almost 50% less compared with Catholic women of reproductive age who never used NFP methods. In comparison, the percentage of Catholic women who had ever used NFP methods and who indicated that they were divorced was greater than the 3% of Catholic women in the Wilson (2002) study. These differences might be reflected in the fact that the NSFG results are population based and the Wilson study survey result was not. One of the strengths of using data from the NSFG is that it is population based and the findings more likely apply to the general population.

Of interest is that the influence of ever use of the hormonal contraceptive pill had no significant influence on divorce but that women who were sterilized had over 2 times the rate of divorce compared to women who were never sterilized. In a previous study with this same data set, this author also showed that sterilization had a very significant influence on the rates of abortion (Rodriguez and Fehring 2012). Sterilization indicates not being open to future children, and could mean not being able to live with one's fertility.

There are many factors that potentially influence divorce among reproductive age couples. Choice of family planning method and especially the use of NFP might be associated with less divorce but it might be due to the religiosity of the woman and couple as well. A logistic regression was conducted with the predictor variables of 1) ever sterilized, 2) ever abortion, 3) multiple sex partners, 4) ever cohabitated, 5) ever use of NFP, 6) importance of religion, and 7) church attendance. Of the above variables only ever use of NFP, frequent Church attendance, and ever sterilized contributed to predicting whether the woman respondents were divorced or not with an $R = 45\%$ ($R \text{ square} = 2\%$). This was also reflected in the finding that frequency of church attendance was associated with a reduced likelihood of divorce.

Another factor is that there are not many Catholic women who have ever used NFP (only about 4% of sexually active Catholic women) in the United States as compared to other family planning methods. In addition, these results are based on ever use of a NFP or contraceptive method. Some of the women in the NFP population could have used contraceptive methods in the past or are currently using sterilization or hormonal methods for family planning purposes. Future studies are needed that follow use of NFP, other family planning methods, and divorce over time.

The frequency of divorce among the Catholic women in the NSFG data set might be under reported as the results were based on the current marital status. Some of these women most likely were divorced in the past and now are currently married. Future studies need to look at other factors that contribute to divorce, such as cohabitation, sexual intercourse before marriage, early sexual debut, number of sexual partners outside of marriage, and use of abortion. Ever use of NFP certainly has some influence on divorce among reproductive age Catholic women; however, how much influence use of NFP has on divorce rates is not known. Religiosity has some influence as well as positive marital dynamics; however, positive marital dynamic such as communication, self-control, motivation, etc. are key factors in the successful use of NFP.

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